

MANAGEMENT PRIORITIES AND CHALLENGES

Management Priorities

NASA's management priorities are driven by both Federal priorities and Agency priorities. The President's management agenda and cross-agency priority goals link NASA's priorities to those of other agencies. NASA's agency priority goals are the top priorities for the next 18 months to two years. Since NASA is primarily a research and development (R&D) agency, the President's science and technology priorities also influence the Agency's management priorities.

CROSS-AGENCY PRIORITY GOALS

NASA is required by the GPRA Modernization Act to address cross-agency priority goals in the Agency Strategic Plan, the Annual Performance Plan, and the Annual Performance Report. For more information regarding the Agency's contributions to those goals, and progress, where applicable, refer to <http://performance.gov>.

NASA'S PRIORITY GOALS

NASA has completed two rounds of agency priority goals with the most recent round outlined in the table below. NASA selected these four agency priority goals in February 2012, and has achieved all of them.

AGENCY PRIORITY GOALS ACHIEVED IN FY 2013

Retired Agency Priority Goal	Responsible Organization	Status
By September 30, 2013, NASA will assess the biological potential of at least one target environment on Mars by obtaining chemical and/or mineralogical analysis of multiple samples of its surface.	Science Mission Directorate, Mars Exploration Program	Completed
By the end of FY 2013, NASA will complete at least three flights delivering research and logistics hardware to the ISS by U.S. developed cargo delivery systems.	Human Exploration Operations Mission Directorate, International Space Station Program	Completed
By September 30, 2013, NASA will finalize cross-program requirements and system definition to ensure that the first test flight of the Space Launch System (SLS) and Multi-Purpose Crew Vehicle (MPCV) programs is successfully achieved at the end of 2017 in an efficient and cost effective way.	Human Exploration Operations Mission Directorate, Exploration Systems Division	Completed
By September 30, 2013 document the maturation of new technologies by completing 4,065 technology-related products, including patents, licenses, and mission use agreements.	Office of the Chief Technologist	Completed

In FY 2013, NASA achieved all of its agency priority goals. A brief summary of progress is provided below, and more details are available at <http://goals.performance.gov/agency/nasa>.

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NASA successfully launched the [Mars Science Laboratory \(MSL\)](#) spacecraft in November 2011. The rover Curiosity touched down on Mars on August 6, 2012, (UTC) to begin its two-year investigation. The MSL spacecraft that carried Curiosity succeeded in every step of the most complex landing ever attempted on Mars. The landing completed the most hazardous phase of the project and began MSL's exciting mission in pursuit of its science objectives. All 10 of Curiosity's highly advanced instruments have operated as expected or better on the surface of Mars. This performance led to the major discovery of conglomerates: physical evidence of an ancient riverbed on Mars, proof that the region of Gale Crater had liquid water, which is a major finding in assessing habitability. Additional analyses including the use of two instruments in Curiosity's onboard analytical laboratory have shown the area of Glenelg/Yellowknife Bay to have once been able to support microbial life.

NASA implemented the U.S.-developed private commercial cargo delivery systems during FY 2013 through the competitively selected Commercial Re-Supply Services contracts awarded to Space Exploration Technologies (SpaceX) and Orbital Sciences Corporation. This NASA initiative is helping to develop a robust U.S. commercial space transportation industry with the goal of achieving safe, reliable and cost-effective transportation to and from low Earth orbit to meet the needs of both commercial and Government customers. By the end of 2013, NASA completed at least three private commercial cargo delivery flights to the [International Space Station \(ISS\)](#) by SpaceX and Orbital Sciences Corporation. The first commercial cargo delivery flight, SpaceX-1, launched and delivered cargo to the ISS October 7, 2012, returning to Earth October 28, 2012. The second cargo delivery flight, SpaceX-2 launched and delivered cargo and science experiments to the ISS March 1, 2013, and returned to Earth March 25, 2013. The third demonstration mission was launched on September 18, 2013, and docked with the ISS on September 29, 2013 delivering 1,300 pounds of cargo, including student experiments, food, and clothing to the ISS.

NASA successfully met the Exploration Systems Development agency priority goal in the third quarter of FY 2013 and continues to make significant progress toward the first test flight of the Space Launch System (SLS) and Orion Multi-Purpose Crew Vehicle (MPCV) in 2018. The Exploration Systems Integration (ESI) Systems Definition Review (SDR), which finalized the cross-program requirements and system definition, was successfully completed and Agency leadership concurred with the review outcome on April 16, 2013.

NASA has exceeded its two-year agency priority goal target to develop and transfer technology, as demonstrated by achieving a total of 5,991 indicators, well above its initial target of 4,065. These indicators included new technology reports, software usage agreements, filing of new patent applications, technology licenses, documented technology spinoffs and NASA technology mission use documents.

NASA's FY 2014-FY 2015 AGENCY PRIORITY GOALS

NASA set four new agency priority goals starting in FY 2014. More information on this latest set of goals can be found at <http://goals.performance.gov/agency/nasa>.

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Agency Priority Goal	Responsible Organization
By September 30, 2015, NASA will increase the utilization of the International Space Station internal and external research facility sites with science and technology payload hardware to 70 percent.	Human Exploration Operations Mission Directorate, International Space Station Program
By September 30, 2015, NASA will complete the Space Launch System, Orion, and Exploration Ground Systems Critical Design Reviews (CDRs), allowing the programs to continue to progress toward Exploration Mission (EM)-1 and EM-2 missions.	Human Exploration Operations Mission Directorate, Exploration Systems Division
By September 30, 2015, the Commercial Crew Program will complete the first phase of certification efforts with Commercial Crew Transportation partners, and will make measurable progress toward the second certification phase with industry partners while maintaining competition.	Human Exploration Operations Mission Directorate, Commercial Crew Program
By October 2018, NASA will launch the James Webb Space Telescope, the premier space-based observatory. To enable this launch date, NASA will complete the James Webb Space Telescope primary mirror backplane and backplane support structures and deliver them to the Goddard Space Flight Center for integration with the mirror segments by September 30, 2015.	Science Mission Directorate, James Webb Space Telescope Program

PRESIDENT'S MULTI-AGENCY SCIENCE AND TECHNOLOGY PRIORITIES

Introduction

The innovative science and engineering research done at NASA is a valuable source of new knowledge that drives important developments in fields ranging from telecommunications to medicine. These technical innovations create entirely new industries that require highly skilled employees and high-wage jobs. This year, the President put forth a list of science and technology priorities for all Federal agencies in order to focus the Nation's efforts in scientific discovery, technological breakthroughs, and innovation. The R&D supporting science and technology research are vital for responding to the challenges and opportunities of the twenty-first century. NASA conducts Agency-specific, mission driven research, which frequently overlaps with the multi-agency research activities identified by the President.

NASA's Annual Performance Plans set short-term targets for programs, projects, and organizations by establishing performance measures, including performance goals, agency priority goals, and annual performance indicators. Performance goals and agency priority goals focus on planned progress over the next 18 months to five years and address more broadly defined activities. Performance measures align to NASA's budget themes and programs in the Congressional Justification. NASA performs many activities that support the President's science and technology priorities, described in greater detail below. NASA selects key performance measures to report externally, so these activities may not be specifically called out in the Agency's performance plans. Nonetheless, NASA's performance measures do indicate alignment with the President's science and technology priorities and illustrates NASA's contribution to the multi-agency research activities identified by the President. The detailed analysis follows the examples below.

The President identified nine priorities that require investments in R&D. Support for activities such as technology transfer, use of R&D facilities, scientific data collection and management, and science, technology, engineering, and mathematics (STEM) education enable a robust science and technology

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enterprise. Cooperation among multiple Federal agencies also is a key to successfully enabling such an enterprise. For a complete description of the President's science and technology priorities, see the President's [Strategy for American Innovation](#) and Office of Management and Budget [Memorandum-13-16](#).

As one of the primary Federal agencies responsible for research and development, NASA's activities in the Annual Performance Plan align with eight of the nine President's science and technology priorities. The eight priorities are described below, with examples of NASA activities that support each priority. NASA does not directly support the ninth priority, Research and Development for National Security Missions, as directed in The [National Aeronautics and Space Act, Public Law No. 111-314, Sec. 20102 \(b\)](#). While NASA research may benefit national security, it is not the primary goal of NASA activities.

Example NASA Activities Supporting the President's Multi-Agency S&T Priorities

Advanced Manufacturing

The President directs Federal agencies to give priority to those programs that advance the state of the art in manufacturing, with particular emphasis on government-industry-university partnerships and enabling technologies that benefit multiple sectors. The Space Act states that part of NASA's mandate is, "[t]he preservation of the United States preeminent position in aeronautics and space through research and technology development related to associated manufacturing processes."

Accordingly, NASA is represented in the public-private partnership of the National Manufacturing Initiative and its signature effort, the [National Network for Manufacturing Innovation](#) (NNMI), by the Space Technology Mission Directorate (STMD). Through [Space Technology Research Grants](#), [Centennial Challenges](#), and [Game Changing Development](#), STMD contributes to the acceleration of technology development pursued within the Institutes for Manufacturing Innovation. The objective of NASA's participation in the NNMI is to increase the number and diversity of collaborators working to address the manufacturing challenges within space applications (both for space and in space manufacturing) and to contribute to modernizing the overall aerospace industry. In addition, Game Changing Development supports NASA's role in the [National Nanotechnology Initiative](#) to coordinate NASA's investment portfolio with other government agencies. NASA supports nanotechnology research and applications for aeronautics and space, focused primarily on reducing vehicle mass and improving reliability through the development of nanotube-based, ultra-high strength composite structures, and nanotechnology derived sensors.

NASA has a long history of working with industry partners in the field of advanced manufacturing. Several NASA Centers are on the cutting edge of manufacturing technology development and have worked to create and maintain these partnerships to accelerate technology useful to NASA. Examples include the [National Center for Advanced Manufacturing](#) in Louisiana and the [NASA/Commonwealth Center for Advanced Manufacturing](#) partnership in Virginia. In addition, NASA is partnering with Boeing to build the first ever 16.5-foot (5-meter) diameter [composite cryotank](#) using an out of autoclave system. NASA also has partnered with Lockheed Martin to develop advanced near net shape technologies for metallic tanks. NASA is leading the way in additive manufacturing (sometimes called three dimensional printing) in space. NASA, in collaboration with Made In Space, LLC, will launch a printer to the International Space Station.

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Clean Energy

The President states that national agencies should give priority to R&D to advance clean-energy solutions. Such solutions will help reduce pollution, greenhouse-gas emissions, and dependence on oil while creating high-wage, highly-skilled, clean-energy jobs and businesses. Improving the efficiency, sustainability, and cost effectiveness of transportation alternatives, and also improving energy efficiency in industry, buildings, and manufacturing, provides the United States with the ability to lead the world in clean-energy technology. Among the Agency's investments in clean-energy solutions, NASA's [Alternative Fuel Effects on Contrails and Cruise Emissions \(ACCESS\) flight program](#) studies the effects of alternate biofuel on aircraft engine performance, emissions and aircraft-generated contrails at altitude. ACCESS's goal is to reduce aviation's impact on the environment by using alternate biofuels (see AR-15-4).

Global Climate Change

Within the White House's U.S. Global Change Research Program, the President instructs agencies to continue making progress toward fulfilling the [2012-2021 Strategic Plan](#). NASA's FY 2015 priority areas include better understanding of the causes and consequences of drought and the interaction of global-change impacts in the Arctic with climate in the mid-latitudes. NASA's Earth science efforts are the front line of the Nation's research into global climate change. New evidence from [NASA-led studies](#) indicates that global warming may increase the risk for extreme rainfall and drought. [New studies of glaciers worldwide](#) using observations from NASA satellites help to resolve differences in estimates of how fast glaciers are disappearing and contributing to sea level rise. A [NASA-led study of atmospheric-river storms from the Pacific Ocean](#) may help scientists better predict major winter snowfalls that hit West Coast mountains and lead to heavy spring runoff and occasional flooding (see ES-15-4 and ES-15-7).

R&D for Informed Policy-making and Management

To help the Nation become more resilient to natural and technological disasters, agencies should focus investments on improving the delivery of information that enhances the understanding of the natural processes that produce hazards. Timely delivery of such information can help promote behavior based on a better understanding of natural and technological hazards. NASA provides timely data on environmental disasters through a combination of the Agency's unique resources, which allows leaders, policy-makers, and responders to make decisions based on real-time scientific data. When super-typhoon Haiyan struck the central Philippines November 8, 2013, [NASA satellites provided data to meteorologists](#) at the Joint Typhoon Warning Center, who were updating forecasts for the typhoon. NASA's TRMM satellite captured visible, microwave and infrared data on the storm. Officials used a [space-based map, generated by scientists at NASA's Jet Propulsion Laboratory](#) in collaboration with the Italian Space Agency, in disaster response efforts. Haiyan made landfall as an extremely powerful super typhoon, perhaps the strongest ever recorded at landfall. With sustained winds estimated at 195 mph (315 kph) by the Joint Typhoon Warning Center, it was equivalent to a Category 5 hurricane (see ES-15-2 and ES-15-8).

Information Technology

The President instructed agencies to give priority to investments that address the challenges and opportunities of the big data revolution, represented by the fast-growing volume of large and complex collections of digital data. Investments in big data can advance agency missions and further scientific discovery and innovation, but require appropriate privacy protections for personal data. The [NASA Earth](#)

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[Exchange](#) is a collaboration and analytical platform that combines state-of-the-art supercomputing, Earth system modeling, workflow management, and NASA remote-sensing data, enhancing research and educational opportunities for the U.S. geoscience community by promoting community-driven research, innovation, and collaboration (see ES-15-10).

Innovation in Biology and Neuroscience

The President instructed agencies to give priority to R&D investments that have the potential to foster biological innovations in health, energy, and agriculture. The President's priorities place emphasis on technologies used for the design of biological systems, understanding systems biology, and high throughput biology. NASA engages in a robust biological research program on Earth and in space. Research aboard the International Space Station, a U.S. Federal laboratory, includes experiments in [biology, biotechnology, and human research](#). NASA sponsors projects like the [Robotic Gardening System](#), which is part of a graduate course sponsored by NASA and the National Space Grant X-Hab Academic Challenge. Also, biological research at Kennedy Space Center [examines how Alzheimer's and other brain diseases](#) occur (see ISS-15-7). NASA also sponsors the [Space Synthetic Biology project](#) through Game Changing Development within Space Technology.

STEM Education

The President is committed to improving STEM education and to ensuring that Federal resources are aligned and directed to improve STEM outcomes and prepare a strong STEM capable workforce. To support these goals, the Administration has proposed a bold STEM education reorganization and a comprehensive [five-year Strategic Plan](#); NASA is aligning its STEM education investments accordingly. NASA also works to ensure that [programs](#) are designed to identify and effectively meet the needs of end-users—students, teachers, schools, districts, and postsecondary institutions—while continuing to reduce STEM-education program fragmentation (see ED-15-1 and ED-15-5). NASA's [Summer of Innovation program](#) challenges middle school students across the United States to share in the excitement of scientific discovery and space exploration through unique, NASA-related STEM opportunities (see ED-15-5).

Innovation and Commercialization

The President instructed agencies to promote innovation and commercialization from Federal R&D investments. Promotional efforts may include support for inducement prizes, fostering the transition of emerging scientific discoveries into engineering disciplines, early-stage technology development, university-industry-government-laboratory partnerships, leveraging of focused and coordinated investments in the Small Business Innovation Research program, and efforts to better link graduate and postdoctoral training with both private and public-sector workforce needs. As part of its mandate in the Space Act, NASA is instructed to, "seek and encourage, to the maximum extent possible, the fullest commercial use of space." In its effort to uphold this mandate, NASA sponsors advanced aerospace system concept studies and foundational technology development efforts on a wide range of topics such as asteroid detection, characterization, and mitigation, as well as in-situ resource utilization, proximity operations, autonomous robotics, and radiation mitigation. As an entry point of NASA's pipeline of revolutionary concepts and early stage technologies, Space Technology supports early-stage development through [Space Technology Research Grants](#), [NASA Innovative Advanced Concepts](#), the [Center Innovation Fund](#), and [Centennial Challenges](#) (see ST-15-1, ST-15-2, ST-15-6).

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Mapping Performance Plans to the President's Multi-Agency S&T Priorities

NASA's FY 2014 and FY 2015 Performance Plans contain many measures that support the President's science and technology priorities. The following table highlights the performance goals and annual performance indicators in FY 2014 and FY 2015 that clearly support the priorities. Measures that do not have a clear link are not listed, even though they may support the priorities indirectly.

Strategic Objective	FY 2014 Performance Goal	FY 2014 Annual Performance Indicator	FY 2015 Performance Goal	FY 2015 Annual Performance Indicator
<u>President's Science and Technology Priority</u> Advanced Manufacturing				
1.1	1.1.1	ESD-14-1	1.1.1	ESD-15-1
		ESD-14-2		ESD-15-2
		ESD-14-3		ESD-15-3
	1.1.2	ERD-14-2	1.1.2	ERD-15-1
		ERD-14-3		ERD-15-2
		ERD-14-6		ERD-15-3
	1.1.3	ERD-14-4		
		1.1.5	ERD-15-4	
1.2	1.2.3	ISS-14-3	1.2.3	ERD-15-5
	1.2.5	ISS-14-6	1.2.5	ISS-15-5
1.3	1.3.3	ISS-14-2	1.3.3	ISS-15-8
1.5			1.5.6	PS-15-8
1.6	1.6.1	JWST-14-1	1.6.1	JWST-15-1
1.7	1.7.2	ST-14-2	1.7.2	ST-15-3
	1.7.3	ST-14-3	1.7.3	ST-15-4
		ST-14-4		ST-15-5
<u>President's Science and Technology Priority</u> Clean Energy				
2.1	2.1.3	AR-14-5	2.1.3	AR-15-3
		AR-14-7		
	2.1.4	AR-14-13	2.1.4	AR-15-4
3.1	3.1.7	AMO-14-20	3.1.7	AMO-15-10
		AMO-14-22		AMO-15-12
<u>President's Science and Technology Priority</u> Global Climate Change				
2.2	2.2.1	ES-14-1	2.2.1	ES-15-1
	2.2.3	ES-14-6	2.2.3	ES-15-3
	2.2.4		2.2.4	ES-15-4
				ES-15-5
		ES-14-7		
				ES-15-6

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Strategic Objective	FY 2014 Performance Goal	FY 2014 Annual Performance Indicator	FY 2015 Performance Goal	FY 2015 Annual Performance Indicator
	2.2.5	ES-14-9	2.2.5	ES-15-7
<u>President's Science and Technology Priority</u> R&D for Informed Policy-making and Management				
1.4	1.4.3	HE-14-7	1.4.3	HE-15-3
2.1			2.1.1	AR-15-1
	2.1.2	AR-14-12	2.1.2	AR-15-2
	2.1.3	AR-14-9		
	2.1.6	AR-14-8	2.1.6	AR-15-7
2.2	2.2.2	ES-14-3	2.2.2	ES-15-2
	2.2.6	ES-14-11	2.2.6	ES-15-8
<u>President's Science and Technology Priority</u> Information Technology				
2.2	2.2.7	ES-14-14	2.2.7	ES-15-10
3.3	3.3.1	AMO-14-17	3.3.1	AMO-15-16
<u>President's Science and Technology Priority</u> Innovation in Biology and Neuroscience				
1.2	1.2.3	ISS-14-3	1.2.3	ISS-15-3
	1.2.5	ISS-14-5	1.2.5	ISS-15-4
		ISS-14-6		ISS-15-5
		ISS-14-8		ISS-15-7
<u>President's Science and Technology Priority</u> Science, Technology, Engineering, and Mathematics (STEM) Education				
2.4	2.4.1	ED-14-1	2.4.1	ED-15-1
	2.4.2	ED-14-6	2.4.2	ED-15-2
			2.4.3	ED-15-3
	2.4.4	ED-14-5	2.4.4	ED-15-4
	2.4.5	ED-14-8	2.4.5	ED-15-5
<u>President's Science and Technology Priority</u> Innovation and Commercialization				
1.2	1.2.5	ISS-14-7	1.2.5	ISS-15-6
1.3	1.3.1	CS-14-1	1.3.1	CS-15-1
		CS-14-2		
	1.3.2	CS-14-4	1.3.2	
		CS-14-5		CS-15-3
1.7	1.7.1	ST-14-1	1.7.1	ST-15-1
				ST-15-2
	1.7.3	ST-14-5	1.7.3	ST-15-6
2.1	2.1.1	AR-14-3		
		AR-14-4		

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Strategic Objective	FY 2014 Performance Goal	FY 2014 Annual Performance Indicator	FY 2015 Performance Goal	FY 2015 Annual Performance Indicator
	2.1.3	AR-14-10		
		AR-14-11		
	2.1.5	AR-14-1	2.1.5	
				AR-15-5
	2.1.6	AR-14-2	2.1.6	
				AR-15-6

LOWER-PRIORITY PROGRAM ACTIVITIES

The President's Budget identifies the lower-priority program activities, where applicable, as required under the GPRA Modernization Act, 31 U.S.C. 1115(b)(10). The public can access the volume at <http://www.whitehouse.gov/omb/budget>.

Management Challenges

NASA leverages its internal reviews to identify management challenges, but also looks to external opinions. NASA's Inspector General provides a list of the top management and performance challenges annually. The Government Accountability Office performs numerous audits of NASA activities, but the High Risk report addresses management challenges specifically.

RESPONSE TO OIG MANAGEMENT CHALLENGES

Each fiscal year, as required by the [Reports Consolidation Act of 2000](#), NASA's Office of Inspector General (OIG) issues a document summarizing what the Inspector General considers to be the most serious management and performance challenges facing the Agency and briefly assesses the Agency's progress in addressing those challenges. The letter and NASA's comments on each management challenge raised by OIG are located in NASA's [FY 2013 Agency Financial Report](#). This listing of NASA's Top Management and Performance Challenges is a key input to the Agency's leadership when evaluating strategies and making adjustments to strategic and performance plans.

In the 2013 letter, OIG identified an overarching challenge shared by all Federal agencies regarding the difficulties of management planning in an environment of increasing fiscal uncertainty. NASA is operating in an uncertain budget environment. The Agency submitted a budget that aligns to the President's request of \$17.7 billion in FY 2014. In addition to this overarching challenge, OIG also identified a list of nine top challenges facing the Agency in FY 2014. The following list of challenges includes a summary of NASA's efforts to use the OIG findings in a constructive way to improve the Agency. While the summary below is based on "Management's Response to the Office of the Inspector General's Memorandum on the Top Management and Performance Challenges of NASA," as published in the FY 2013 Agency Financial Report, NASA has updated information since the report's publication in early FY 2014.

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1. Considering Whether to Further Extend the Life of the International Space Station

The first management challenge identified by OIG was the question of whether to further extend the life of the International Space Station (ISS) beyond 2020, and the uncertainty presented by the lack of a decision. The President recently announced his decision to extend operations of ISS until at least 2024. Extending the life of the International Space Station to at least 2024 will advance the Nation's goals in space and benefit humanity on Earth. Extending ISS will enable the development of a stable commercial space industry in transportation of crew and cargo to low Earth orbit; enable significantly more research opportunities that will benefit humanity through research in fundamental physics, biology, and medicine; and expand knowledge of Earth, the solar system, and the universe. Most importantly, operation of ISS to at least 2024 is critical to the future human exploration of deep space.

2. Developing the Space Launch System, Orion, and Exploration Ground Systems

The Exploration Systems Development (ESD) division is aggressively preparing the Space Launch System (SLS), Orion, and the Exploration Ground Systems that will provide the foundational elements for deep space exploration. NASA is targeting FY 2018 for the first launch of the combined SLS and Orion vehicles. ESD has established a proactive affordability initiative that each program has implemented to find innovative and effective ways to avoid the need for greater expenditures in the development phases of each of the programs. NASA is adapting existing flight and ground hardware, facilities, and designs in the ESD division in an effort to reduce the overall cost of design reviews, testing, and certification.

3. Securing Commercial Crew Transportation Services

OIG identified four challenges to NASA's Commercial Crew program (CCP). The first challenge was unstable funding. For the past several years, CCP received in appropriations significantly less funding than the President's budget requested, resulting in delays of the expected completion of the commercial crew development phase until 2017. Moreover, OIG found that NASA has yet to project the total amount of funding required by year, which makes it difficult for NASA to manage its wider portfolio of spaceflight programs and reduces the transparency of the Program's budget submissions. The final appropriation in FY 2014 for CCP was \$696 million. NASA continues to strive for transparent and comprehensive justifications for the budget requests. OIG next identified inadequate integration of NASA's cost estimates with the CCP schedule. NASA has developed the Agency's program costs for CCP on a year-by-year basis throughout its life, which informs the Agency's annual President's Budget Request. NASA will continue to employ a series of reviews, involving both internal and external checks to continually examine the Commercial Crew Program's status. OIG next identified delays in certification guidance from NASA to its commercial partners as a challenge. NASA's Certification Products Contracts initially involved over 400 deliverables spanning three different partners with varying designs and processes and formats resulting in thousands of NASA comments in response. CCP was successful in dispositioning all deliverables by the end of September 2013, which fully met the need for timely response as part of the overall CCP acquisition strategy. In addition, CCP conducted a workshop to evaluate the lessons learned from the initial round of deliverables and developed process improvements to ensure timely disposition of deliverables in the future. The final challenge identified by OIG was the difficulty presented in coordinating with other Federal agencies. NASA and the Federal Aviation Administration have ongoing and comprehensive interactions regarding crew/public safety requirements and regulations. OIG also recommended, and the agency is pursuing, an increased level of collaboration with the United States Air Force.

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4. Ensuring Continued Efficacy of the Space Communications Network

In 2006, NASA initiated the Space Communications and Navigation (SCaN) program to create an integrated Agency-wide space communications and navigation architecture. The evolution of the integrated system will take place in phases. Currently, SCaN is adding new capabilities that extend the functionality of the program's networks, including the Near Earth Network, the Space Network, and the Deep Space Network. The new capabilities will be incorporated into the integrated architecture. SCaN also manages the Spectrum Management Program for the Agency, including discussions with other space-faring nations regarding spectrum allocation. With a planned FY 2014 budget of \$538.5 million, the networks that make up SCaN will initially remain independent.

NASA has plans to upgrade its Space Network through a Space Network Ground Segment Sustainment (SGSS) project. The purpose of the SGSS project is to implement a modern ground station that will enable delivery of high quality services to the Space Network community while significantly reducing operations and maintenance costs. The Space Network is also in the process of upgrading and replenishing the Tracking and Data Relay Satellite fleet of satellites, many of which are operating well beyond their planned lives. NASA is upgrading the Deep Space Network, which is run from three ground-based sites (Goldstone, California; Madrid, Spain; and Canberra, Australia). NASA believes the upgrades would support a greater number of missions and spacecraft as well as the increased complexity and data transfer requirements of those missions.

5. Maintaining Cost and Schedule for the James Webb Space Telescope

Since the September 2011 rebaseline, the James Webb Space Telescope (JWST) program has stayed within its approved budget (both profile and total life cycle) and has maintained its October 2018 launch readiness date. Several strategies are employed to maintain cost and schedule performance of JWST. First, NASA established a dedicated program office at Headquarters, headed by a program director that reports to the NASA Associate Administrator. Second, this new program office conducts greatly increased communication efforts, including daily and weekly working discussions between program and project officials, weekly discussions with senior NASA Headquarters officials, participation by program officials in monthly project technical and programmatic reviews, and quarterly progress reviews with senior NASA officials and senior industry officials. Third, NASA expanded its cost and schedule analyses that are performed and subsequently reported by the program and project offices, all to provide additional information for decision making by program and project management. Fourth, program and project managers prepare a substantial set of annual milestones prior to each fiscal year. These milestones focus on the most difficult and important work by all JWST-supporting organizations for the upcoming fiscal year, and managers track progress against the milestones for reporting internally to NASA and to all external stakeholders in the government and scientific community.

6. Managing NASA's Infrastructure and Facilities

OIG identified five challenges in NASA's management of infrastructure and facilities, the first of which was the effect of changes in the Nation's space policy on the strategy for demolition or disposal of unneeded facilities. NASA's demolition program has been active since 2004 and currently has demolition projects scheduled through 2017. The near-term focus is to demolish those facilities that supported the Space Shuttle Program but are no longer needed by the Agency and are not being modified for future needs. In addition, NASA will demolish several technical facilities that the Agency no longer needs or

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will be retiring in the near future. As part of its budget formulation process, NASA assesses its infrastructure annually to identify facilities that should be included in the demolition program. Each year, NASA identifies 20-50 sites for demolition. The next challenge OIG identified was NASA's decentralized approach to managing its infrastructure. OIG said this creates a rivalry between the Centers that leads them to build or preserve facilities that duplicate capabilities available elsewhere in the Agency or lack an identified mission use. NASA is implementing a strategy of refurbishing, consolidating, or replacing key facilities, which has already achieved financial savings. NASA estimates that it will reduce administrative space by 398,000 square feet from a 2012 baseline by 2015. OIG next addressed the challenge of property partnerships. OIG found that the challenge for NASA is to use leasing when appropriate to generate revenue to offset facilities operations and maintenance costs, while not using it as a way to hold on to facilities it does not need. NASA is partnering with the private sector and with other Federal agencies to make underutilized NASA facilities available to others. The OIG letter also identified the challenge of using Federal transfer of budget authority to defray some of the costs of maintaining NASA's infrastructure. NASA is working with the General Services Administration to identify underutilized spaces at NASA Centers and then to transfer those assets to other Federal agencies. The final infrastructure challenge identified by OIG was adequately maintaining facilities in an environment of rising utility, labor, and material costs and decreasing facility budgets. NASA relies on [reliability-centered maintenance \(RCM\)](#) of critical systems. RCM is an ongoing process that gathers data from operating systems performance and uses this data to improve design and future maintenance. RCM uses predictive testing techniques to identify conditions that could lead to failure or accelerated deterioration.

7. Overhauling NASA's Information Technology Governance Structure

The OIG found that NASA needs to implement an effective information technology (IT) governance approach that appropriately aligns authority and responsibility commensurate with the Agency's overall Mission. The NASA Chief Information Officer (CIO) now reports directly to the Administrator. In the first quarter of FY 2014, the Mission Support Council approved a Phase 2 Information Technology Governance model decision package. OCIO will conduct an Agency-wide Six Sigma Kaizen event to improve IT procurement approval processes with corresponding financial system changes. This will ensure alignment of IT procurements with Agency strategic direction. OCIO assessed and identified improvements for IT governing boards. Upon approval in early FY 2014, OCIO will update board charters and communicate the streamlined board structure to Agency stakeholders. OCIO will work with mission directorates to develop common roles and responsibilities and enhance coordination. In FY 2014, OCIO will consider the results of the IT assessment and implement recommendations as appropriate to ensure organization and governance to meet NASA's IT needs.

8. Ensuring Security of Agency Information Technology Systems

The OIG letter stated that, to protect the Agency against inevitable cyberattacks, NASA must ensure that its IT systems and associated components are regularly safeguarded, assessed, and monitored. To this end, NASA's OCIO continues to complete major milestones toward its comprehensive, risk-based IT security program implementation based on continuous monitoring and use of automated tools. To meet the changing threat and risk environment, OCIO will: update NASA's information security policies; develop and test a real-time IT security dashboard reporting tool; transition from manually generated to dynamically generated System Security Plans; and develop a framework for an IT Security Tools Repository to leverage enterprise IT security tools and services. OCIO will identify mandatory security controls mapped to the SANS Institute/Federal Bureau of Investigation Annual Top 20 Critical Controls. To address Web-related vulnerabilities, OCIO will implement the Web Application Security Program.

MANAGEMENT PRIORITIES AND CHALLENGES

OCIO will mature the NASA Security Operations Center threat assessment and incident response capabilities, specifically introducing the Security Incident Management (SIM) system. The SIM system is an automated analysis capability that allows IT security professionals to focus on true (rather than false positive) security issues to better protect NASA's information systems.

9. Ensuring Integrity of the Contracting and Grant Process

Approximately 80 percent of NASA's \$17.7 billion FY 2012 budget was spent on contracts to procure goods and services and provide funding to grant and award recipients. OIG found that, given the large amount of taxpayer funds NASA spends on contract awards, managers are constantly challenged to ensure that the Agency pays contractors in accordance with contract terms and receives fair value for its money. NASA has made significant improvements in the oversight and operation of the Small Business Innovation Research (SBIR) program to reduce the likelihood of fraud, waste, and abuse. The NASA Shared Services Center implemented a new process highlighting Contracting Officer Representative involvement in reviewing and accepting deliverables and certification before payment is made. The SBIR Program Office also implemented the recommendations articulated in the OIG's January 2011 and February 2012 reports.

In response to the OIG's April 8, 2013, report on Energy Savings Performance Contracts (ESPCs), NASA has aggressively pursued a range of corrective actions to update requirements, training, and oversight of ESPCs across the Agency. Over time, increased experience with these contracts has expanded the Agency's perspective of earlier standards.